P28933.A02

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Chikara MURAKATA et al.

Group Art Unit: not yet assigned

Serial No

: 10/560,230

(National Stage of PCT/JP2004/008375)

Examiner: not yet assigned

Filed

: December 9, 2005 (I.A. Filed: June 9, 2004)

For

: THIADIAZOLINE DERIVATIVE

INFORMATION DISCLOSURE STATEMENT

Commissioner of Patents
U.S. Patent and Trademark Office
Customer Service Window, Mail Stop Amendment
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

Pursuant to 37 C.F.R. § 1.56 and 37 C.F.R. §§ 1.97-1.98, Applicants hereby direct the Examiner's attention to the following documents cited in the International Search Report for International Application PCT/JP2004/008375 of which the above-referenced application is a National Stage:

- (1) WO 03/051854 A1, June 26, 2003;
- (2) EP 1 454 903 A1, September 8, 2004; Applicants note that this document is a family member of document (1);
- (3) U.S. Patent Application Publication No. 2006/0074113 A1 (MURAKATA et al.), April 6, 2006; Applicants note that this document is copending and commonly assigned to the above-referenced application, a family member of documents (1) and (2), and the national stage of International Application PCT/JP02/12961;

- (4) JP 2000-229959 A, August 22, 2000, accompanied by an English language abstract thereof (provided by Patent Abstracts of Japan); Applicants note that this document is cited and discussed at page 3, line 11 of the present application;
- (5) Kubota, S., et al. "Novel Rearrangement of 3-acyl-5-acylamino-2,3-dihydro-1,3,4-thiadiazole 1-oxides into 1,3,4-oxadiazoles" Heterocycles, vol. 24, No. 1, 1986, pp. 21-24;
- (6) Kubota, S., et al. "Synthesis of 4-Acyl-2-(acylamino)-Δ²-1,3,4-thiadiazolines and 4-Acyl-2-amino-Δ²-1,3,4-thiadiazoline by Acylation of Thiosemicarbazones" J. Org. Chem., vol. 45, No. 8, 1980, pp. 1473-1477; Applicants note that this document is cited and discussed at page 25, line 31 and at page 26, line 17 of the present application;
- (7) Kubota, S., et al. "Stereoselective S-Oxidation of 5-Substituted 4-Acetyl- Δ²-1,3,4-thiadiazolines: X-Ray Crystal Structure of 4-Acetyl-2-acetylamino-5-methyl-5-phenyl-Δ²-1,3,4-thiadiazoline 1-Oxide" J. Chem. Soc., Chem. Comm., 1982, No. 16, pp. 901-902;
- (8) U.S. Patent No. 4,338,449 (TAO et al.), July 6, 1982;
- (9) Schenone, S., et al. "3-Arylsulphonyl-5-arylamino-1,3,4-thiadiazol-2(3*H*)ones as Anti-inflammatory and Analgesic Agents", Bioorganic and Medicinal Chemistry, 9, 2001, pp. 2149-2153;
- (10) Bhalla, M., et al. "Benzopyran-2-one derivatives: anti-inflammatory, analgesic and antiproteolytic agents" European Journal of Medicinal Chemistry, 29, 1994, pp. 713-717;

- (11) JP 62-53976 A, March 9, 1987; Applicants note that this document is also cited and discussed at page 3, line 14 of the present application;
- (12) EP 0 217 519 A1, April 8, 1987; Applicants note that this document is a family member of document (11);
- (13) U.S. Patent No. 4,927,822 (BROWN et al.), May 22, 1990; Applicants note that this document is a family member of documents (11) and (12).

Applicants further direct the Examiner's attention to the following documents cited and discussed in the present application:

- (14) Blangy, A., et al., "Phosphorylation by p34^{cdc2} Regulates Spindle Association of Human Eg5, a Kinesin-Related Motor Essential for Bipolar Spindle Formation In Vivo", Cell, vol. 83, 1995, pp. 1159-1169; Applicants note that this document is cited and discussed at page 2, lines 15 and 19 and at page 55, line 29 of the present application;
- (15) Kapoor, T. M., et al., "Probing Spindle Assembly Mechanism with Monastrol, a Small Molecule Inhibitor of the Mitotic Kinesin, Eg5", The Journal of Cell Biology, vol. 150, 2000, pp.975-988; Applicants note that this document is cited and discussed at page 2, line 15 of the present application;
- (16) Turner, J., et al., "Crystal Structure of the Mitotic Spindle Kinesin Eg5
 Reveals a Novel Conformation of the Neck-linker", The Journal of
 Biological Chemistry, vol. 276, 2001, pp. 25496-25502; Applicants

- note that this document is cited and discussed at page 2, line 23 of the present application;
- (17) Maliga, Z. et al., "Evidence that Monastrol Is an Allosteric Inhibitor of the Mitotic Kinesin Eg5", Chemistry and Biology, vol. 9, 2002, pp.989-996; Applicants note that this document is cited and discussed at page 2, line 23 of the present application;
- (18) Kapoor, T. M., et al., "Allele-specific activators and inhibitors for kinesin" Proc. Natl. Acad. Sci. USA, vol. 96, 1999, pp. 9106-9111; Applicants note that this document is cited and discussed at page 2, line 26 of the present application;
- (19) Lockhart, A. et al., "Kinetics and Motility of the Eg5 Microtubule Motor", Biochemistry, vol. 35, 1999, pp. 2365-2373; Applicants note that this document is cited and discussed at page 2, line 26 and at page 56, line 24 of the present application;
- (20) U.S. Patent No. 6,414,121 B1 (WOOD et al.), July 2, 2002; Applicants note that this document is cited and discussed at page 2 line 35 of the present application;
- (21) Mayer, T. U., et al., "Small Molecule Inhibitor of Mitotic Spindle Bipolarity Identified in a Phenotype-Based Screen", Science, vol. 286, 1999, pp. 971-974; Applicants note that this document is cited and discussed at page 3, line 5 of the present application;
- (22) Hoque, T., et al., "Synthesis of Some 5-spiro-4-acetyl-2-(Acetylamino)- Δ^2 -1,3,4-Thiadiazoline from Ketone Thiosemicarbazones", Journal of the Bangladesh Chemical Society, vol. 5 (2), 1992, pp. 127-132;

- Applicants note that this document is cited and discussed at page 32, line 15, at page 25, line 30 and at page 26, line 18;
- (23) WO 01/98278 A1, December 27, 2001; Applicants note that this document is cited and discussed at page 3, line 5 of the present application;
- (24) U.S. Patent Application Publication No. 2005/0187232 A1 (FINER et al.), August 25, 2005; Applicants note that this document is a family member of document (23);
- (25) U.S. Patent Application Publication No. 2004/0254203 A1 (FINER et al.), December 16, 2004; Applicants note that this document is a family member of documents (23) and (24);
- (26) U.S. Patent Application Publication No. 2004/0023996 A1 (FINER et al.), February 5, 2004; Applicants note that this document is a family member of documents (23)-(25);
- (27) U.S. Patent No. 6,831,085 B1 (BERGNES et al.), December 14, 2004;
 Applicants note that this document is a family member of documents
 (23)-(26);
- (28) U.S. Patent No. 6,630,479 B1 (FINER et al.), October 7, 2003;

 Applicants note that this document is a family member of documents (23)-(27);
- (29) U.S. Patent No. 6,562,831 B1 (FINER et al.), May 13, 2003; Applicants note that this document is a family member of documents (23)-(28);
- (30) U.S. Patent No. 6,545,004 B1 (FINER et al.), April 8, 2003; Applicants note that this document is a family member of documents (23)-(29);

- (31) WO 02/056880 A1, July 25, 2002; Applicants note that this document is cited and discussed at page 3, line 6 of the present application;
- (32) U.S. Patent Application Publication No. 2004/0132830 A1 (FINER et al.), July 8, 2004; Applicants note that this document is a family member of document (31);
- (33) WO 02/057244 A1, July 25, 2002; Applicants note that this document is cited and discussed at page 3, line 6 of the present application;
- (34) U.S. Patent Application Publication No. 2004/0132719 A1 (FINER et al.), July 8, 2004; Applicants note that this document is a family member of document (33);
- (35) U.S. Patent Application Publication No. 2006/0014736 A1 (FINER et al.), January 19, 2006; Applicants note that this document is a family member of documents (33) and (34);
- (36) WO 02/079149 A2, October 10, 2002; Applicants note that this document is cited and discussed at page 3, line 7 of the present application;
- (37) U.S. Patent Application Publication No. 2002/0143026 A1 (LOMBARDO et al.), October 3, 2002; Applicants note that this document is a family member of document (36);
- (38) U.S. Patent Application Publication No. 2002/0165240 A1 (KIMBALL et al.), November 7, 2002; Applicants note that this document is a family member of documents (36) and (37);

- (39) U.S. Patent Application Publication No. 2003/0008888 A1 (KIMBALL et al.), January 9, 2003; Applicants note that this document is a family member of documents (36)-(38);
- (40) WO 02/079169 A1, October 10, 2002; Applicants note that this document is cited at page 2, line 18 of the present application; Applicants also note that this document is a family member of documents (36)-(39);
- (41) WO 01/56994 A1, August 9, 2001; Applicants note that this document is cited and discussed at page 3, line 11 of the present application;
- (42) WO 93/22311 A1, November 11, 1993; Applicants note that this document is cited and discussed at page 3, line 13 of the present application;
- (43) DD 243 930 A1, March 18, 1987; Applicants note that this document is cited and discussed at page 25, line 31 and at page 26, line 21 of the present application.

Applicants further direct the Examiner's attention to the following copending and commonly assigned U.S. application:

(44) U.S. Serial No. 10/553,222, filed October 17, 2005 and entitled "THIADIAZOLINE DERIVATIVE"; Applicants note that this document is a National Stage of International Application PCT/JP2004/005489.

Furthermore, Applicants direct the Examiner's attention to the information of record in the above-listed copending and commonly assigned applications (3) and (44):

- (45) MANDELKOW, E., et al., Trends in Cell Biology, vol. 12, 2002, pp. 585-591;
- (46) WO 03/079973 A2, October 2, 2003;
- (47) U.S. Patent Application Publication No. 2005/0119484 A1 (BRESLIN et al.), June 2, 2005; Applicants note that this document is a family member of document (46);
- (48) TAO, E.V. et al., J. Heterocyclic Chem., Vol. 21, 1984, pp. 599-601;
- (49) HUANG, T. B., et al., Phosphorus, Sulfur & Silicon, vol. 122, pp. 307-312 (1997);
- (50) M.A. KHALIL et al., Arch. Pharm. (Weinheim), Vol. 326, 1993, pp. 489-492;
- (51) A.A. FARGHALY et al., Arch. Pharm. Pharm. Med. Chem., Vol. 333, No. 2-3, 2000, pp. 53-57;
- (52) El-S.M. EL-KHAWASS et al., Alexandria Journal of Pharmaceutical Sciences, Vol. 4, No. 1, 1990, pp. 77-79;
- (53) H.M. MOKHTAR et al., Bull. Pharm. Sci., Assiut University, Vol. 18, Part 2, December 1995, pp. 59-67;
- (54) M.A. KHALIL, Alexandria J. of Pharm. Sciences, Vol. 3, No. 2, 1989, pp. 221-224;
- (55) L.L. AWAD et al., Alexandria J. of Pharm. Sci., Vol. 3, No. 2, 1989, pp. 119-121;

- (56) S.Y. HASSAN et al., J. Saudi Chem. Soc., Vol. 3, No. 2, 1999, pp. 171-176;
- (57) B. SCHULZE et al., Zeitschrift fuer Chemie, Vol. 29, No. 5, 1989, pp. 166-167;
- (58) JP 2000-204077, July 25, 2000;
- (59) WO 00/42029, July 20, 2000, Applicants note that this document is an English language family member of document (58);
- (60) U.S. Patent No. 6,235,762 B1 (TAKASUGI et al.), May 22, 2001;
- (61) S. KUBOTA et al., Heterocycles, Vol. 4, 1976, pp. 1909-1912;
- (62) A. WENGEL et al., Pestic. Sci., Vol. 30, 1990, pp. 223-233;
- (63) E.E. YCOBA et al., Khim. Geterotsikl. Soedin., Vol. 10, 1994, pp. 1337-1344;
- (64) Y. NAKAYAMA et al., J. Org. Chem., Vol. 49, 1984, pp. 1703-1707;
- (65) E.V. TAO et al., Heterocycles, Vol. 29, 1989, pp. 133-140;
- (66) L. SOMOGYI, Tetrahedron, Vol. 47, 1991, pp. 9305-9316;
- (67) L. SOMOGYI et al., Tetrahedron, Vol. 48, 1992, pp. 9355-9362;
- (68) Khim. Geterotsiki. Soedin, Vol. 12, 1992, pp. 1689-1697;
- (69) S. ANDREAE et al., Journal f. prakt. Chemie., Vol. 328, 1986, Heft 2, pp. 205-214;
- (70) L. SOMOGYI, Liebigs Ann. Chem., 1994, pp. 623-627;
- (71) L. SOMOGYI, Liebigs Ann., 1995, pp. 721-724;
- (72) Z.M. NOFAL et al., Arch. Pharm. Res., Vol. 25, 2002, pp. 250-257;
- (73) S. KABILAN et al., Asian Journal of Chemistry, Vol. 14, 2002, pp. 879-883;

- (74) M.A.M. ALHO et al., ARKIVOC 2000, Vol. 1, pp. 627-640;
- (75) K.N. ZELENIN et al., Chemistry of Heterocyclic Compounds, Vol. 35, 1999, pp. 87-92;
- (76) I.V.U. ZAVEDENII, Khimiya I Khimicheskaya Takhnologiya, Vol. 43, 2000, pp. 64-68;
- (77) N.S. HABIB et al., Alex. J. Pharm. Sci., Vol. 10, 1996, pp. 53-58;
- (78) F.A. ASHOUR et al., Bull. Fac. Pharm. Cairo Univ., Vol. 31, 1993, pp. 381-386;
- (79) M.H. KHAN et al., J. Pesticide Sci., Vol. 19, 1994, pp. 305-308;
- (80) Dokl. Aka. Nauk SSSR, Vol. 296, 1987, pp. 1133-1137;
- (81) Zhurnal Organicheskoi Khimii, 1986, pp. 663-664;
- (82) R.J. KUBAN et al., Cryst. Res. Technol., Vol. 22, 1987, pp. 799-802;
- (83) K.N. THIMMAIAH et al., Inorganica Chimica Acta, Vol. 107, 1985, pp. 1-4;
- (84) U.S. Patent No. 4,346,225 (TAO et al.), August 24, 1982;
- (85) CAS Registry Numbers: 443105-88-2, 443105-83-7, 443105-78-0, 443105-73-5, 443105-64-4, 443105-56-4, 443105-51-9, 443105-46-2, 443105-41-7, 443105-34-8, 442654-91-3, 438540-30-8, 433235-71-3, 432536-58-8, 432518-92-8, 419551-57-8, 405925-79-3, 400833-35-4, 356773-31-4, 356773-12-1, 355435-20-0, 352225-16-2, 332389-28-3, 332389-25-0, 89992-30-3, 356773-98-3, 356773-79-0, 356773-31-4, 356773-13-2, 350581-79-2, 346715-36-4, 332389-27-2, 332389-25-0, 330683-67-5, 330683-65-3, 313558-45-1, 313548-79-7, 313523-91-0, 313523-88-5, 307332-32-7, 307332-31-6, 307332-30-5, 307332-29-2,

307332-28-1, 307332-24-7, 307332-22-5, 300808-92-8, 300719-38-4, 298218-64-1, 296801-28-0, 292066-09-2, 332389-28-3, 332389-25-0, 332389-24-9, 332389-23-8, 296801-28-0, 198069-12-4, 149638-52-8, 149638-50-6, 149638-48-2, 149638-46-0, 149638-44-8, 149638-42-6;

- (86) H. GRAUBAUM et al., Z. Chem., Vol. 26, 1986, pp. 99-100;
- (87) U.S. Patent No. 6,207,690 B1 (URBAN et al.), March 27, 2001;
- (88) U.S. Patent No. 5,814,647 (URBAN et al.), September 29, 1998;

 Applicants note that this document is a family member of document (87);
- (89) DING, Y. et al., "Syntheses and Anticancer Activity of Ribonucleoside Analogues Containing Thio-Substituted Five-Membered Heterocyclic Base", Bioorganic and Medicinal Chemistry Letters, Vol. 7, No. 13, pp. 1607-1610 (1997).

Copies of the above-listed documents (with the exception of U.S. patents and U.S. patent applications), the International Search Reports (in English) for International Applications PCT/JP02/12961 and PCT/JP2004/005489, and the English language translation of the International Preliminary Report on Patentability for International Application PCT/JP2004/008375 are enclosed together with a completed copy of the Form PTO-1449 listing these documents. Accordingly, the Examiner is requested to consider these documents and to indicate such consideration by returning a signed and initialed copy of the Form PTO-1449 with the next official communication.

P28933.A02

Further to the U.S. Patent and Trademark Office's decision to partially

waive the requirements under 37 C.F.R. § 1.98 (a)(2)(i) and (iii), copies of the

U.S. patents and U.S. patent applications cited above are not enclosed herewith.

However, if any copies are needed, the Examiner is respectfully requested to

contact the undersigned.

Applicants note that no fee is required for the consideration of the

materials submitted herewith. Nevertheless, the Patent and Trademark Office is

hereby authorized to charge Deposit Account No. 19-0089 any fee which may be

deemed necessary to ensure consideration of the submitted materials.

If there should be any questions, the Examiner is invited to contact the

undersigned at the telephone number listed below.

Respectfully submitted, Chikara MURAKATA et al.

Bruce H. Bernstein

Reg. No. 29,027

October 25, 2006 GREENBLUM & BERNSTEIN, P.L.C. 1950 Roland Clarke Place Reston, VA 20191 (703) 716-1191

Heribert F. Muensterer Reg. No. 50,417

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S. Department of Commerce	,
Patent and Trademark Office	

Atty. Docket No. P28933

Application No. 10/560,230

BY APPLICANT

BY Several sheets if necessary)

Applicant

Chikara MURAKATA et al.

Filing Date December 9, 2005 Group Unknown

ILS PATENT DOCUM	ENITO

EXAMINER INITIAL			DOC	CUME	ENT	NUM	BER		DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
/SY/	2006	0	0	7	4	1	1	3	04/06/06	MURAKATA et al.			
/SY/		4	3	3	8	4	4	9	07/06/82	TAO et al.			

FOREIGN PATENT DOCUMENTS

	7-4		DOC	CUMI	ENT	NUM	BER		DATE COUNTRY	CLASS	SUBCLASS	TRANSLATION YES NO		
/SY/	03	1	0	5	1	8	5	4	06/26/03	W.I.P.O				
/SY/		1	4	5	4	9	0	3	09/08/04	E.P.O				
/SY/	2000	-	2	2	9	9	5	9	08/22/00	JAPAN				
/SY/	62	-		5	3	9	7	6	03/09/87	JAPAN				
/SY/		0	2	1	7	5	1	9	04/08/87	E.P.O				

OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

English Language abstract of JP 2000-229959.

, ,		English Editigating about the Look Leaves.
7555500000	2	Kubota, S., et al. "Novel Rearrangement of 3-acyl-5-acylamino-2,3-dihydro-1,3,4-thiadiazole 1-oxides into 1,3,4-oxadiazoles" Heterocycles, vol. 24, No. 1, 1986, pp. 21-24.
000000000000000000000000000000000000000	3	Kubota, S., et al. "Synthesis of 4-Acyl-2-(acylamino)- Δ^2 -1,3,4-thiadiazolines and 4-Acyl-2-amino- Δ^2 -1,3,4-thiadiazolines by Acylation of Thiosemicarbazones" J. Org. Chem., vol. 45, No. 8, 1980, pp. 1473-1477.
000000000000000000000000000000000000000	4	Kubota, S., et al. "Stereoselective S-Oxidation of 5-Substituted 4-Acetyl- Δ^2 -1,3,4-thiadiazolines: X-Ray Crystal Structure of 4-Acetyl-2-acetylamino-5-methyl-5-phenyl- Δ^2 -1,3,4-thiadiazoline 1-Oxide" J. Chem. Soc., Chem. Comm., 1982, No. 16, pp. 901-902.
000000000000000000000000000000000000000	5	Schenone, S., et al. "3-Arylsulphonyl-5-arylamino-1,3,4-thiadiazol-2(3 <i>H</i>)ones as Anti-inflammatory and Analgesic Agents", Bioorganic and Medicinal Chemistry, 9, 2001, pp. 2149-2153.
0000000	6	Bhalla, M., et al. "Benzopyran-2-one derivatives: anti-inflammatory, analgesic and antiproteolytic agents" European Journal of Medicinal Chemistry, 29, 1994, pp. 713-717.
000000000000000000000000000000000000000	7	Blangy, A., et al., "Phosphorylation by p34 ^{cdc2} Regulates Spindle Association of Human Eg5, a Kinesin-Related Motor Essential for Bipolar Spindle Formation In Vivo", Cell, vol. 83, 1995, pp. 1159-1169.
000000000000000000000000000000000000000	8	Kapoor, T. M., et al., "Probing Spindle Assembly Mechanism with Monastrol, a Small Molecule Inhibitor of the Mitotic Kinesin, Eg5", The Journal of Cell Biology, vol. 150, 2000, pp.975-988.
000000000000000000000000000000000000000	9	Turner, J., et al., "Crystal Structure of the Mitotic Spindle Kinesin Eg5 Reveals a Novel Conformation of the Neck-linker", The Journal of Biological Chemistry, vol. 276, 2001, pp. 25496-25502.
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	11	Kapoor, T. M., et al., "Allele-specific activators and inhibitors for kinesin" Proc. Natl. Acad. Sci. USA, vol. 96, 1999, pp. 9106-9111.
\/	12	Lockhart, A. et al., "Kinetics and Motility of the Eg5 Microtubule Motor", Biochemistry, vol. 35, 1999.

*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

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EXAMINER

pp.2365-2373.

S. Department of Commerce Patent and Trademark Office

Atty. Docker No. P28933

Application No. 10/560,230

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Applicant Chikara MURAKATA et al.

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OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

/OV/	13	Mayer, T. U., et al., "Small Molecule Inhibitor of Mitotic Spindle Bipolarity Identified in a Phenotype-
/SY/		Based Screen", Science, vol. 286, 1999, pp. 971-974.
/SY/	14	Hoque, T., et al., "Synthesis of Some 5-spiro-4-acetyl-2-(Acetylamino)- Δ^2 -1,3,4-Thiadiazoline from Ketone Thiosemicarbazones", Journal of the Bangladesh Chemical Society, vol. 5 (2), 1992, pp. 127-132.
/SY/	15	U.S. Serial No. 10/553,222, filed October 17, 2005 and entitled "THIADIAZOLINE DERIVATIVE"; Applicants note that this document is a National Stage of International Application PCT/JP2004/005489.
	16	MANDELKOW, E., et al., Trends in Cell Biology, vol. 12, 2002, pp. 585-591.

EXAMINER DATE CONSIDERED

*EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP 609; draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

S. Department of Commerce Patent and Trademark Office

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